**http://www.helpguide.org/mental/autism\_signs\_symptoms.htm**

**Signs and symptoms of autism in babies and toddlers**

If autism is caught in infancy, treatment can take full advantage of the young brain’s remarkable plasticity. Although autism is hard to diagnose before 24 months, symptoms often surface between 12 and 18 months.  If signs are detected by 18 months of age, intensive treatment may help to rewire the brain and reverse the symptoms.

The earliest signs of autism involve the absence of normal behaviors—not the presence of abnormal ones—so they can be tough to spot. In some cases, the earliest symptoms of autism are even misinterpreted as signs of a “good baby,” since the infant may seem quiet, independent, and undemanding. However, you can catch warning signs early if you know what to look for.

Some autistic infants don't respond to cuddling, reach out to be picked up, or look at their mothers when being fed.

**Early signs of autism in babies and toddlers**

* Doesn’t make eye contact (e.g. look at you when being fed).
* Doesn't smile when smiled at.
* Doesn't respond to his or her name or to the sound of a familiar voice.
* Doesn’t follow objects visually.
* Doesn't point or wave goodbye or use other gestures to communicate.
* Doesn’t follow the gesture when you point things out.
* Doesn’t make noises to get your attention.
* Doesn’t initiate or respond to cuddling.
* Doesn’t imitate your movements and facial expressions.
* Doesn’t reach out to be picked up.
* Doesn’t play with other people or share interest and enjoyment.
* Doesn’t ask for help or make other basic requests.

**The following delays warrant an immediate evaluation by your child’s pediatrician.**

* **By 6 months:** No big smiles or other warm, joyful expressions.
* **By 9 months:** No back-and-forth sharing of sounds, smiles, or other facial expressions.
* **By 12 months:** Lack of response to name.
* **By 12 months:**No babbling or “baby talk.”
* **By 12 months:** No back-and-forth gestures, such as pointing, showing, reaching, or waving.
* **By 16 months:** No spoken words.
* **By 24 months:** No meaningful two-word phrases that don’t involve imitating or repeating.

**Health Impacts of Lead Poisoning from** http://www.lead.org.au/fs/fst7.html

**Growth & development**

* Delayed neurodevelopment [e.g. in sitting up, walking, talking] [(**2**,](http://www.lead.org.au/fs/fst7.html#Silbergeld, E. K. (1992). Neurological perspective on lead toxicity.In Human Lead Exposure, ed H. L. Needleman, CRC Press) [**58**](http://www.lead.org.au/fs/fst7.html#Dr. Ben Balzer, "Lead Poisoning Slide Show, 6 September 2000" ))
* Stature and growth rate reduction ([**1,**](http://www.lead.org.au/fs/fst7.html#Smith, M. A., Grant, L. D. & Sors, A. (1989). Lead exposure and child development: an international assessment. Kleeven Academic Publishers.)[**2,**](http://www.lead.org.au/fs/fst7.html#Silbergeld, E. K. (1992). Neurological perspective on lead toxicity.In Human Lead Exposure, ed H. L. Needleman, CRC Press)[**3,**](http://www.lead.org.au/fs/fst7.html#National Research Council (US). (1993). Measuring lead exposure in infants children and other sensitive populations. National Academy Press, Washington DC.)[**18**](http://www.lead.org.au/fs/fst7.html#Schwartz, J. (1992). Low level health effects of lead: Growth, developmental and neurological distrubances. In Human Lead Exposure, ed H. L. Needleman, CRC Press)**,** [**35**](http://www.lead.org.au/fs/fst7.html#Royce, S. E. (1992). Lead toxicity. US Dept of Health and Human Services Agency for Toxic Substances and Disease Registry. Sept)**,** [**39**](http://www.lead.org.au/fs/fst7.html#Agency for Toxic Substances Disease Registrar. (1989). Toxicological profile of lead. US ATSDR.))
* Impaired pituitary-thyroid endocrine system ([**18**](http://www.lead.org.au/fs/fst7.html#Schwartz, J. (1992). Low level health effects of lead: Growth, developmental and neurological distrubances. In Human Lead Exposure, ed H. L. Needleman, CRC Press)**,** [**21**](http://www.lead.org.au/fs/fst7.html#Castellino, N., Castellino, P. & Sannolo, N. (ed). (1995). Inorganic lead exposure. Lewis Publishers))
* Osteoporosis in later years ([**43**](http://www.lead.org.au/fs/fst7.html#Wentzel, Michael, Democrat & Chronicle, 25/2/02, UR [University of Rochester] links childhood lead to osteoporosis:))
* Weight loss ([**58**](http://www.lead.org.au/fs/fst7.html#Dr. Ben Balzer, "Lead Poisoning Slide Show, 6 September 2000" ))

**Cognitive development**

* I.Q. levels decrease ([**1,**](http://www.lead.org.au/fs/fst7.html#Smith, M. A., Grant, L. D. & Sors, A. (1989). Lead exposure and child development: an international assessment. Kleeven Academic Publishers.)[**2,**](http://www.lead.org.au/fs/fst7.html#Silbergeld, E. K. (1992). Neurological perspective on lead toxicity.In Human Lead Exposure, ed H. L. Needleman, CRC Press)[**3,**](http://www.lead.org.au/fs/fst7.html#National Research Council (US). (1993). Measuring lead exposure in infants children and other sensitive populations. National Academy Press, Washington DC.)[**4,**](http://www.lead.org.au/fs/fst7.html#Chemwatch Database. (1996) Lead Arsenate.)[**5,**](http://www.lead.org.au/fs/fst7.html#Alperstein, G., Reznik, R. & Duggin, G. (1991). Lead: Subtle forms and new modes of poisoning. The Medical Journal of Australia Vol 155 Sept 16.)[**6,**](http://www.lead.org.au/fs/fst7.html#Berry, M., Garrard, J. & Greene, D. (1994). Reducing Lead Exposure in Australia. Commonwealth Department of Human Services and Health, Canberra.)[**15,**](http://www.lead.org.au/fs/fst7.html#Bellinger, D. & Needleman, H. L. (1992). Neurodevelopmental effects of low-level lead exposure in children. In Human Lead Exposure, ed H. L. Needleman, CRC Press)[**24,**](http://www.lead.org.au/fs/fst7.html#Fischbein, A. (1992). Occupational and environmental lead exposure. In Environmental and Occupational Medicine, 2nd edn. Ed W.N. Rom. Little, Brown & Co.)[**35**](http://www.lead.org.au/fs/fst7.html#Royce, S. E. (1992). Lead toxicity. US Dept of Health and Human Services Agency for Toxic Substances and Disease Registry. Sept)**,** [**36,**](http://www.lead.org.au/fs/fst7.html#Gatsonis, C. A.. & Needleman, H. L. (1992). Recent epidemological studies of low-level lead exposure and the IQ of children: a meta-analytic review In Human Lead Exposure, ed H. L. Needleman, CRC Press)[**39**](http://www.lead.org.au/fs/fst7.html#Agency for Toxic Substances Disease Registrar. (1989). Toxicological profile of lead. US ATSDR.)**,** [**41**](http://www.lead.org.au/fs/fst7.html#Lanphear, Bruce P; Dietrich, Kim; Auinger, Peggy; Cox, Christopher. (2000) Cognitive Deficits Associated with Blood Lead Concentrations <10 µg/dL in US Children and Adolescents, Public Health Reports Nov 2000, Volume 115, 521-529;), [**58**](http://www.lead.org.au/fs/fst7.html#Dr. Ben Balzer, "Lead Poisoning Slide Show, 6 September 2000" ))
* Cognitive function deficits ([**2,**](http://www.lead.org.au/fs/fst7.html#Silbergeld, E. K. (1992). Neurological perspective on lead toxicity.In Human Lead Exposure, ed H. L. Needleman, CRC Press)[**26,**](http://www.lead.org.au/fs/fst7.html#Repko, J. (1976). Behavioural toxicology of inorganic Lead. In Health Effects of Occupational Lead and Arsenic Exposure - a symposium, ed.B. W. Carnow, US Dept of Health, Education and Welfare Public Health Service Divn of Surveillance Hazard Evaluation and Field Studies, Feb.)[**33**](http://www.lead.org.au/fs/fst7.html#Fergusson, D. M., Hurwood, L. J. & Lynskey, M. T. (1997). Early dentine lead levels and educational outcomes at 18 years. In Journal of Child Psychology and Psychiatry, Vol 38 No 4. pp. 471-478.))
* Verbal function / linguistic deficits ([**2,**](http://www.lead.org.au/fs/fst7.html#Silbergeld, E. K. (1992). Neurological perspective on lead toxicity.In Human Lead Exposure, ed H. L. Needleman, CRC Press)[**14**](http://www.lead.org.au/fs/fst7.html#Wedeen R. P. (1992). Lead, the kidneys and hypertension. In Human Lead Exposure, ed H. L. Needleman, CRC Press)**,** [**15**](http://www.lead.org.au/fs/fst7.html#Bellinger, D. & Needleman, H. L. (1992). Neurodevelopmental effects of low-level lead exposure in children. In Human Lead Exposure, ed H. L. Needleman, CRC Press))
* Learning difficulties ([**11**](http://www.lead.org.au/fs/fst7.html#Goldstein, G. W. (1992). Developmental neurobiology of lead toxicity. In Human Lead Exposure, ed H. L. Needleman, CRC Press)**,** [**15**](http://www.lead.org.au/fs/fst7.html#Bellinger, D. & Needleman, H. L. (1992). Neurodevelopmental effects of low-level lead exposure in children. In Human Lead Exposure, ed H. L. Needleman, CRC Press)**,** [**35**](http://www.lead.org.au/fs/fst7.html#Royce, S. E. (1992). Lead toxicity. US Dept of Health and Human Services Agency for Toxic Substances and Disease Registry. Sept))
* Decreased educational performance ([**35**](http://www.lead.org.au/fs/fst7.html#Royce, S. E. (1992). Lead toxicity. US Dept of Health and Human Services Agency for Toxic Substances and Disease Registry. Sept))
* Decreased reading, maths, non-verbal reasoning ability & short term memory, even at blood lead levels less than 10µg/dL ([**41**](http://www.lead.org.au/fs/fst7.html#Lanphear, Bruce P; Dietrich, Kim; Auinger, Peggy; Cox, Christopher. (2000) Cognitive Deficits Associated with Blood Lead Concentrations <10 µg/dL in US Children and Adolescents, Public Health Reports Nov 2000, Volume 115, 521-529;))
* Autism ([**7**](http://www.lead.org.au/fs/fst7.html#Clark, H. R. (1995). The cure for all diseases. Pro Motion Publishing, San Diego California.)) in genetically predisposed individuals with metallothionein dysfunction ([**42**](http://www.lead.org.au/fs/fst7.html#Walsh, William J; Usman, Anju; Tarpey, Jeffrey; and Kelly, Tanika. (2001) Metallothionein And AutismPfeiffer Treatment Center, Health Research Institute, Naperville, Illinois USA.))

**Behaviour**

* Aggression, violence, hostility, anti-social or delinquent behaviour ([**8**](http://www.lead.org.au/fs/fst7.html#Needleman, H. L., Riess, J. A., Tobin, M., Biesecker, G. & Greenhouse, J.B. (1996). Bone Lead Levels and Delinquent Behavior. vol 275 No 5 JAMA. February 7. pp 363-369.)**,** [**26**](http://www.lead.org.au/fs/fst7.html#Repko, J. (1976). Behavioural toxicology of inorganic Lead. In Health Effects of Occupational Lead and Arsenic Exposure - a symposium, ed.B. W. Carnow, US Dept of Health, Education and Welfare Public Health Service Divn of Surveillance Hazard Evaluation and Field Studies, Feb.))
* Attention problems; distractibility, restlessness ([**8**](http://www.lead.org.au/fs/fst7.html#Needleman, H. L., Riess, J. A., Tobin, M., Biesecker, G. & Greenhouse, J.B. (1996). Bone Lead Levels and Delinquent Behavior. vol 275 No 5 JAMA. February 7. pp 363-369.)**,** [**12,**](http://www.lead.org.au/fs/fst7.html#Rice, D. C., (1992). Behavioural Impairment produced by developmental lead exposure: Evidence from primate research. In Human Lead Exposure, ed H. L. Needleman, CRC Press)[**15**](http://www.lead.org.au/fs/fst7.html#Bellinger, D. & Needleman, H. L. (1992). Neurodevelopmental effects of low-level lead exposure in children. In Human Lead Exposure, ed H. L. Needleman, CRC Press)**,** [**21**](http://www.lead.org.au/fs/fst7.html#Castellino, N., Castellino, P. & Sannolo, N. (ed). (1995). Inorganic lead exposure. Lewis Publishers)**,** [**38**](http://www.lead.org.au/fs/fst7.html#Werbach, M. F. (1997). Foundations of nutritional medicine. Third Line press, Tarzana California.), [**58**](http://www.lead.org.au/fs/fst7.html#Dr. Ben Balzer, "Lead Poisoning Slide Show, 6 September 2000" ))
* Externalising and internalising behaviours ([**8**](http://www.lead.org.au/fs/fst7.html#Needleman, H. L., Riess, J. A., Tobin, M., Biesecker, G. & Greenhouse, J.B. (1996). Bone Lead Levels and Delinquent Behavior. vol 275 No 5 JAMA. February 7. pp 363-369.))
* Hyperactive behaviours, difficult to manage ([**1,**](http://www.lead.org.au/fs/fst7.html#Smith, M. A., Grant, L. D. & Sors, A. (1989). Lead exposure and child development: an international assessment. Kleeven Academic Publishers.)[**2,**](http://www.lead.org.au/fs/fst7.html#Silbergeld, E. K. (1992). Neurological perspective on lead toxicity.In Human Lead Exposure, ed H. L. Needleman, CRC Press)[**8**](http://www.lead.org.au/fs/fst7.html#Needleman, H. L., Riess, J. A., Tobin, M., Biesecker, G. & Greenhouse, J.B. (1996). Bone Lead Levels and Delinquent Behavior. vol 275 No 5 JAMA. February 7. pp 363-369.))
* Inappropriate / uncontrolled behaviours similar to ADD behaviours, increased frequency ([**2,**](http://www.lead.org.au/fs/fst7.html#Silbergeld, E. K. (1992). Neurological perspective on lead toxicity.In Human Lead Exposure, ed H. L. Needleman, CRC Press)[**11**](http://www.lead.org.au/fs/fst7.html#Goldstein, G. W. (1992). Developmental neurobiology of lead toxicity. In Human Lead Exposure, ed H. L. Needleman, CRC Press))
* Irritability ([**1,**](http://www.lead.org.au/fs/fst7.html#Smith, M. A., Grant, L. D. & Sors, A. (1989). Lead exposure and child development: an international assessment. Kleeven Academic Publishers.)[**38**](http://www.lead.org.au/fs/fst7.html#Werbach, M. F. (1997). Foundations of nutritional medicine. Third Line press, Tarzana California.))
* Lethargy ([**1**](http://www.lead.org.au/fs/fst7.html#Smith, M. A., Grant, L. D. & Sors, A. (1989). Lead exposure and child development: an international assessment. Kleeven Academic Publishers.))
* Increased school absenteeism ([**35**](http://www.lead.org.au/fs/fst7.html#Royce, S. E. (1992). Lead toxicity. US Dept of Health and Human Services Agency for Toxic Substances and Disease Registry. Sept))

**Hearing**

* Hearing impairment; auditory sensitivity decreased ([**2,**](http://www.lead.org.au/fs/fst7.html#Silbergeld, E. K. (1992). Neurological perspective on lead toxicity.In Human Lead Exposure, ed H. L. Needleman, CRC Press)[**3,**](http://www.lead.org.au/fs/fst7.html#National Research Council (US). (1993). Measuring lead exposure in infants children and other sensitive populations. National Academy Press, Washington DC.)[**5,**](http://www.lead.org.au/fs/fst7.html#Alperstein, G., Reznik, R. & Duggin, G. (1991). Lead: Subtle forms and new modes of poisoning. The Medical Journal of Australia Vol 155 Sept 16.)[**10**](http://www.lead.org.au/fs/fst7.html#Fox, D. A. (1992). Visual and Auditory System Alterations following Developmental or Adult Lead Exposure: a critical review. In Human Lead Exposure, ed H. L. Needleman, CRC Press.)**,** [**14**](http://www.lead.org.au/fs/fst7.html#Wedeen R. P. (1992). Lead, the kidneys and hypertension. In Human Lead Exposure, ed H. L. Needleman, CRC Press)**,** [**18**](http://www.lead.org.au/fs/fst7.html#Schwartz, J. (1992). Low level health effects of lead: Growth, developmental and neurological distrubances. In Human Lead Exposure, ed H. L. Needleman, CRC Press)**,** [**21**](http://www.lead.org.au/fs/fst7.html#Castellino, N., Castellino, P. & Sannolo, N. (ed). (1995). Inorganic lead exposure. Lewis Publishers)**,** [**26,**](http://www.lead.org.au/fs/fst7.html#Repko, J. (1976). Behavioural toxicology of inorganic Lead. In Health Effects of Occupational Lead and Arsenic Exposure - a symposium, ed.B. W. Carnow, US Dept of Health, Education and Welfare Public Health Service Divn of Surveillance Hazard Evaluation and Field Studies, Feb.)[**32,**](http://www.lead.org.au/fs/fst7.html#Schwartz, J. & Otto, D. (1987). Blood lead, hearing thresholds, and neurobehavioral development in children and youth. In Archives of Environmental Health Vol 42, No. 21 pp 153-160, 1st May 1987.)[**35**](http://www.lead.org.au/fs/fst7.html#Royce, S. E. (1992). Lead toxicity. US Dept of Health and Human Services Agency for Toxic Substances and Disease Registry. Sept)**,** [**39**](http://www.lead.org.au/fs/fst7.html#Agency for Toxic Substances Disease Registrar. (1989). Toxicological profile of lead. US ATSDR.), [**58**](http://www.lead.org.au/fs/fst7.html#Dr. Ben Balzer, "Lead Poisoning Slide Show, 6 September 2000" ))
* Auditory evoked response patterns altered ([**2**](http://www.lead.org.au/fs/fst7.html#Silbergeld, E. K. (1992). Neurological perspective on lead toxicity.In Human Lead Exposure, ed H. L. Needleman, CRC Press))
* Auditory processing altered ([**2,**](http://www.lead.org.au/fs/fst7.html#Silbergeld, E. K. (1992). Neurological perspective on lead toxicity.In Human Lead Exposure, ed H. L. Needleman, CRC Press)[**10**](http://www.lead.org.au/fs/fst7.html#Fox, D. A. (1992). Visual and Auditory System Alterations following Developmental or Adult Lead Exposure: a critical review. In Human Lead Exposure, ed H. L. Needleman, CRC Press.))

**Sight**

* Retinal degeneration ([**6,**](http://www.lead.org.au/fs/fst7.html#Berry, M., Garrard, J. & Greene, D. (1994). Reducing Lead Exposure in Australia. Commonwealth Department of Human Services and Health, Canberra.)[**10**](http://www.lead.org.au/fs/fst7.html#Fox, D. A. (1992). Visual and Auditory System Alterations following Developmental or Adult Lead Exposure: a critical review. In Human Lead Exposure, ed H. L. Needleman, CRC Press.))
* Depressed sensitivity of rod photoreceptors ([**10**](http://www.lead.org.au/fs/fst7.html#Fox, D. A. (1992). Visual and Auditory System Alterations following Developmental or Adult Lead Exposure: a critical review. In Human Lead Exposure, ed H. L. Needleman, CRC Press.))
* Perceptual function deficits ([**2,**](http://www.lead.org.au/fs/fst7.html#Silbergeld, E. K. (1992). Neurological perspective on lead toxicity.In Human Lead Exposure, ed H. L. Needleman, CRC Press)[**21**](http://www.lead.org.au/fs/fst7.html#Castellino, N., Castellino, P. & Sannolo, N. (ed). (1995). Inorganic lead exposure. Lewis Publishers))
* Visuo-spatial skills deficit [eg jigsaws] ([**15**](http://www.lead.org.au/fs/fst7.html#Bellinger, D. & Needleman, H. L. (1992). Neurodevelopmental effects of low-level lead exposure in children. In Human Lead Exposure, ed H. L. Needleman, CRC Press))

**Movement and muscular**

* Visual-motor skills deficits [hand-eye coordination] ([**2,**](http://www.lead.org.au/fs/fst7.html#Silbergeld, E. K. (1992). Neurological perspective on lead toxicity.In Human Lead Exposure, ed H. L. Needleman, CRC Press)[**3,**](http://www.lead.org.au/fs/fst7.html#National Research Council (US). (1993). Measuring lead exposure in infants children and other sensitive populations. National Academy Press, Washington DC.)[**15**](http://www.lead.org.au/fs/fst7.html#Bellinger, D. & Needleman, H. L. (1992). Neurodevelopmental effects of low-level lead exposure in children. In Human Lead Exposure, ed H. L. Needleman, CRC Press)**,** [**26**](http://www.lead.org.au/fs/fst7.html#Repko, J. (1976). Behavioural toxicology of inorganic Lead. In Health Effects of Occupational Lead and Arsenic Exposure - a symposium, ed.B. W. Carnow, US Dept of Health, Education and Welfare Public Health Service Divn of Surveillance Hazard Evaluation and Field Studies, Feb.))
* Fine motor dysfunction ([**1,**](http://www.lead.org.au/fs/fst7.html#Smith, M. A., Grant, L. D. & Sors, A. (1989). Lead exposure and child development: an international assessment. Kleeven Academic Publishers.)[**2,**](http://www.lead.org.au/fs/fst7.html#Silbergeld, E. K. (1992). Neurological perspective on lead toxicity.In Human Lead Exposure, ed H. L. Needleman, CRC Press)[**3**](http://www.lead.org.au/fs/fst7.html#National Research Council (US). (1993). Measuring lead exposure in infants children and other sensitive populations. National Academy Press, Washington DC.))
* Motor function deficits ([**2**](http://www.lead.org.au/fs/fst7.html#Silbergeld, E. K. (1992). Neurological perspective on lead toxicity.In Human Lead Exposure, ed H. L. Needleman, CRC Press))
* Impaired muscular strength and endurance ([**26**](http://www.lead.org.au/fs/fst7.html#Repko, J. (1976). Behavioural toxicology of inorganic Lead. In Health Effects of Occupational Lead and Arsenic Exposure - a symposium, ed.B. W. Carnow, US Dept of Health, Education and Welfare Public Health Service Divn of Surveillance Hazard Evaluation and Field Studies, Feb.))
* Paralysis ([**3**](http://www.lead.org.au/fs/fst7.html#National Research Council (US). (1993). Measuring lead exposure in infants children and other sensitive populations. National Academy Press, Washington DC.))
* Somatic complaints [aches and pains] ([**8**](http://www.lead.org.au/fs/fst7.html#Needleman, H. L., Riess, J. A., Tobin, M., Biesecker, G. & Greenhouse, J.B. (1996). Bone Lead Levels and Delinquent Behavior. vol 275 No 5 JAMA. February 7. pp 363-369.)**,** [**38**](http://www.lead.org.au/fs/fst7.html#Werbach, M. F. (1997). Foundations of nutritional medicine. Third Line press, Tarzana California.))

**Digestive system**

* Impaired Vitamin D metabolism [affecting bone remodelling, mineral absorption and calcium uptake] ([**2,**](http://www.lead.org.au/fs/fst7.html#Silbergeld, E. K. (1992). Neurological perspective on lead toxicity.In Human Lead Exposure, ed H. L. Needleman, CRC Press)[**3,**](http://www.lead.org.au/fs/fst7.html#National Research Council (US). (1993). Measuring lead exposure in infants children and other sensitive populations. National Academy Press, Washington DC.)[**6,**](http://www.lead.org.au/fs/fst7.html#Berry, M., Garrard, J. & Greene, D. (1994). Reducing Lead Exposure in Australia. Commonwealth Department of Human Services and Health, Canberra.)[**18**](http://www.lead.org.au/fs/fst7.html#Schwartz, J. (1992). Low level health effects of lead: Growth, developmental and neurological distrubances. In Human Lead Exposure, ed H. L. Needleman, CRC Press)**,** [**24,**](http://www.lead.org.au/fs/fst7.html#Fischbein, A. (1992). Occupational and environmental lead exposure. In Environmental and Occupational Medicine, 2nd edn. Ed W.N. Rom. Little, Brown & Co.)[**35**](http://www.lead.org.au/fs/fst7.html#Royce, S. E. (1992). Lead toxicity. US Dept of Health and Human Services Agency for Toxic Substances and Disease Registry. Sept)**,** [**38**](http://www.lead.org.au/fs/fst7.html#Werbach, M. F. (1997). Foundations of nutritional medicine. Third Line press, Tarzana California.)**,** [**39**](http://www.lead.org.au/fs/fst7.html#Agency for Toxic Substances Disease Registrar. (1989). Toxicological profile of lead. US ATSDR.), [**58**](http://www.lead.org.au/fs/fst7.html#Dr. Ben Balzer, "Lead Poisoning Slide Show, 6 September 2000" ))
* Colic ([**3,**](http://www.lead.org.au/fs/fst7.html#National Research Council (US). (1993). Measuring lead exposure in infants children and other sensitive populations. National Academy Press, Washington DC.)[**25,**](http://www.lead.org.au/fs/fst7.html#Rempel, D. (1989). California occupational health program JAMA Vol 262 No 4 July.)[**35**](http://www.lead.org.au/fs/fst7.html#Royce, S. E. (1992). Lead toxicity. US Dept of Health and Human Services Agency for Toxic Substances and Disease Registry. Sept))
* Loss of appetite ([**1,**](http://www.lead.org.au/fs/fst7.html#Smith, M. A., Grant, L. D. & Sors, A. (1989). Lead exposure and child development: an international assessment. Kleeven Academic Publishers.)[**2**](http://www.lead.org.au/fs/fst7.html#Silbergeld, E. K. (1992). Neurological perspective on lead toxicity.In Human Lead Exposure, ed H. L. Needleman, CRC Press))
* Vomiting ([**1,**](http://www.lead.org.au/fs/fst7.html#Smith, M. A., Grant, L. D. & Sors, A. (1989). Lead exposure and child development: an international assessment. Kleeven Academic Publishers.)[**4**](http://www.lead.org.au/fs/fst7.html#Chemwatch Database. (1996) Lead Arsenate.))
* Constipation, diarrhoea, anorexia ([**38**](http://www.lead.org.au/fs/fst7.html#Werbach, M. F. (1997). Foundations of nutritional medicine. Third Line press, Tarzana California.), [**58**](http://www.lead.org.au/fs/fst7.html#Dr. Ben Balzer, "Lead Poisoning Slide Show, 6 September 2000" ))
* Abdominal cramps ([**39**](http://www.lead.org.au/fs/fst7.html#Agency for Toxic Substances Disease Registrar. (1989). Toxicological profile of lead. US ATSDR.),[**58**](http://www.lead.org.au/fs/fst7.html#Dr. Ben Balzer, "Lead Poisoning Slide Show, 6 September 2000" ))

http://motherchildnutrition.org/malnutrition/about-malnutrition/impact-of-malnutrition.html

Impact of Malnutrition

Pregnant and lactating women and young children less than three years are most vulnerable to malnutrition.

Scientific evidence has shown that beyond the age of 2-3 years, the effects of chronic malnutrition are irreversible. This means that to break the intergenerational transmission of poverty and malnutrition, children at risk must be reached during their first two years of life.

**Child malnutrition** is the single biggest contributor to under-five mortality due to greater susceptibility to infections and slow recovery from illness.

Children who do not reach their optimum height or consistently experience bouts of weight loss during childhood are affected in the long term in numerous ways. They do not reach their optimum size as adults (and so may have less physical capacity for work), their brains are affected (resulting in lower IQs) and they are at greater risk of infection (which kills many children during their early years).

Child malnutrition impacts on education attainment. The degree of cognitive impairments is directly related to the severity of stunting and Iron Deficiency Anaemia. Studies show that stunted children in the first two years of life have lower cognitive test scores, delayed enrolment, higher absenteeism and more class repetition compared with non stunted children. Vitamin A deficiency reduces immunity and increases the incidence and gravity of infectious diseases resulting in increased school absenteeism.

Child malnutrition impacts on economic productivity. The mental impairment caused by iodine deficiency is permanent and directly linked to productivity loss. The loss from stunting is calculated as 1.38% reduced productivity for every 1% decrease in height while 1% reduced productivity is estimated for every 1% drop in iron status (source Haddad and Bouis, 1990).

**Maternal malnutrition** increases the risk of poor pregnancy outcomes including obstructed labour, premature or low-birth-weight babies and postpartum haemorrhage. Severe anaemia during pregnancy is linked to increased mortality at labour.

**Low-birth-weight** is a significant contributor to infant mortality. Moreover, low birth-weight babies who survive are likely to suffer growth retardation and illness throughout their childhood, adolescence and into adulthood. Growth-retarded adult women are likely to carry on the vicious cycle of malnutrition by giving birth to low birth-weight babies.

http://www.adoptionarticlesdirectory.com/Article/Child-Abuse-and-Neglect--Effects-on-child-development--brain-development--and-interpersonal-relationships/42

There are clear links between neglect and abuse and later psychological, emotional, behavioral, and interpersonal disorders. The basis for this linkage is the impact that abuse and neglect have on brain development. Daniel Siegel, medical director of the Infant and Preschool Service at the University of California, L.A., has found important links between interpersonal experiences and neurobiological development.   
  
We know that a child uses the parent’s state of mind to regulate the child’s own mental processes. The child’s developing capacity to regulate emotions and develop a coherent sense of self requires sensitive and responsive parenting. The National Adoption Center found that 52% of adoptable children have attachment disorder symptoms. In another study, by Cicchetti, & Barnett , 80% of abused or maltreated infants exhibited attachment disorder symptoms. The best predictor of a child’s attachment classification is the state of mind with respect to attachment of the birth mother. A birth mother’s attachment classification before the birth of her child can predict with 80% accuracy her child’s attachment classification at six years of age. That is a remarkable finding. Finally, recent research by Mary Dozier, Ph.D. found that the attachment classification of a foster mother has a profound effect on the attachment classification of the child. She found that the child’s attachment classification becomes similar to that of the foster mother after three months in placement. These findings strongly argue for a non-genetic mechanism for the transmission of attachment patterns across generations.   
  
Children who have been sexually abused are at significant risk of developing anxiety disorders (2.0 times the average), major depressive disorders (3.4 times average), alcohol abuse (2.5 times average), drug abuse (3.8 times average), and antisocial behavior (4.3 times average) .  
  
Generally the left hemisphere of the brain is the site of language, motor activity on the right side of the body, and logical thought based on language. The right hemisphere of the brain is responsible for motor activity on the left side of the body, context perceptions, and holistic perception. The orbito-frontal cortex (the part of the brain directly behind the eyes) is responsible for integrating emotional responses generated in the limbic system with higher cognitive functions, such as planning and language, in the cerebral cortex’s prefrontal lobes. The left orbito-frontal cortex is responsible for memory creation while the right orbito-frontal cortex is responsible for memory retrieval. Healthy functioning requires an integrated right and left hemisphere. A substantial number of synaptic connections among brain cells develop during the first year of life. An integrated brain requires connections between the hemispheres by the corpus callosum. Abused and neglected children have smaller corpus callosum than non-abused children. Abused and neglected children have poorly integrated cerebral hemispheres. This poor integration of hemispheres and underdevelopment of the orbitofrontal cortex is the basis for such symptoms as difficulty regulating emotion, lack of cause-effect thinking, inability to accurately recognize emotions in others, inability of the child to articulate the child’s own emotions, an incoherent sense of self and autobiographical history, and a lack of conscience.   
  
The brains of abused and neglected children are not as well integrated as the brains of non-abused children. This helps explain why abused and neglected children have significant difficulties with emotional regulation, integrated functioning, and social development. Conscience development and the capacity for empathy are largely functions of the orbito-frontal cortex. When development in this area of the brain is hindered, there are important social and emotional difficulties. It is very interesting that the orbito-frontal cortex is sensitive to face recognition and eye contact. Abused and neglected children frequently have disorders of attachment because of their birth-parents lack of sensitive responsive interactions with the child.

Early interpersonal experiences have a profound impact on the brain because the brain circuits responsible for social perception are the same as those that integrate such functions as the creation of meaning, the regulation of body states, the regulation of emotion, the organization of memory, and the capacity for interpersonal communication and empathy. Stressful experiences that are overtly traumatizing or chronic cause chronic elevated levels of neuroendocrine hormones. High levels of these hormones can cause permanent damage to the hippocampus, which is critical for memory. Based on this we can assume that psychological trauma can impair a person’s ability to create and retain memory and impede trauma resolution.   
  
Abused and neglected children exhibit a variety of behaviors that can lead to any number of diagnoses. However, the effect of early abuse and neglect on the child can be seen in just a few critical areas of development. These areas include emotional regulation, response flexibility, a coherent integrated sense of self across time, the ability to engage in affect attunement with significant others (empathy and emotional connectedness), and conscience development.   
  
The effects of early maltreatment on a child’s development are profound and long lasting. It is the impact of maltreatment on a child’s developing brain that causes effects seen in a wide variety of domains including social, psychological, and cognitive development. The ability to regulate emotions and become emotionally attuned with another depends on early experiences and the development of specific regions of the brain. Early maltreatment causes deficits in the development of these brain regions, primarily the orbito-frontal cortex and corpus callosum, because of the toxic effects of stress hormones on the developing brain.   
  
These findings strongly suggest that effective treatment requires an affectively attuned relationship. Siegel stated, “As parents reflect with their securely attached children on the mental states that create their shared subjective experience, they are joining with them in an important co-constructive process of understanding how the mind functions. The inherent feature of secure attachment – contingent, collaborative communication – is also a fundamental component in how interpersonal relationships facilitate internal integration in a child.” This has implications for the effective treatment of maltreated children. For example, when in a therapeutic relationship the client is able to reflect upon aspects of traumatic memories and experience the affect associated with those memories without becoming dysregulated, the client develops an expanded capacity to tolerate increasing amounts of affect. The client learns to self-regulate. The attuned resonant relationship between client and therapist enables the client to make sense (a left-hemisphere function) out of memories, autobiographical representations, and affect (right hemisphere functions).  
  
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